

# **EXHIBIT I-1**

Brandywine Communications Technologies, LLC's Preliminary Infringement Contentions Re:  
U.S. Pat. No. 6,970,501 by AT&T Corp. and SBC Internet Services, Inc.

Brandywine Communications Technologies, LLC ("Plaintiff") provides the following contentions with respect to Defendants' infringement. AT&T Corp. and SBC Internet Services, Inc. (collectively "Defendant") infringe the '501 patent by using, operating, selling, and offering to sell xDSL (e.g., ADSL2, ADSL2+, HDSL, HDSL2, SDSL, SHDSL, or VDSL2) equipment, protocols and/or services; as well as using, operating, selling, and offering to sell access to xDSL networks, which comprises xDSL modems, digital subscriber line access multiplexers, line testing equipment, operations support systems, and other related equipment; (collectively, "infringing instrumentalities").<sup>1</sup> The following chart sets forth exemplary descriptions of such equipment where appropriate for illustrative purposes.

Claim No.	U.S. Pat. No. 6,970,501	Infringement
1	An apparatus comprising:	The infringing instrumentalities include, for example, Defendant's modems and/or digital subscriber line access multiplexers

<sup>1</sup> Unless otherwise specifically set forth herein, these contentions demonstrate literal infringement of each element of the asserted claims of the '501 patent. To the extent that Defendant alleges that a claim element is not present in the infringing product, Brandywine contends that the infringing products also meet each element under the doctrine of equivalents. More specifically, in its investigation and analysis of the infringing product, Brandywine did not identify any substantial differences between the elements of the '501 patent claims and the corresponding features of the infringing instrumentalities, as set forth herein. In each instance, the identified features of the infringing instrumentalities perform substantially the same function in substantially the same way to achieve substantially the same result as the corresponding claim elements.


Brandywine contends that Defendant directly infringes each asserted claim of the '501 patent. In addition, Defendant induces infringement of each asserted claim by, among other things, specifically intending or willfully blind to the infringement that it is causing, actively aiding and abetting others whose use of such services and products constitutes direct infringement of the '501 patent. Defendant's aiding and abetting includes, for example, distributing advertisements and instructions to others, and/or supporting their directly infringing use.

Brandywine also contends that Defendant contributes to the infringement of the '501 patent by, among other things, specifically intending or willfully blind to the infringement that it is causing, providing to others products and/or equipment for use in practicing the patented process, knowing or willfully blind to the fact that the products and/or equipment are a material part of the invention and especially made or especially adapted for use in an infringement of the '501 patent. For example, Defendant is providing equipment to others to deliver service over its xDSL network.


To the extent Defendant has proffered interrogatories regarding direct and/or indirect infringement, Plaintiff incorporates its responses to such interrogatories herein.

Plaintiff notes that the present contentions are necessarily preliminary for reasons including that Plaintiff has not received discovery from Defendant and that claim construction and expert discovery have not been completed in this case. Further, Plaintiff expressly reserves the right to supplement and/or amend its infringement positions if and when warranted by further information obtained during the discovery process, claim construction, or further analysis.





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		<p>("DSLAMs"), which include transceivers for communicating over the subscriber loop, line testing equipment, along with other network equipment and software that interface with, control, monitor, and/or test the modems and/or DSLAMs (commonly referred to as the operations support system or "OSS").</p>
	<p>a modem connected to a subscriber loop, the modem being capable of operating in one or more modes that are compatible with one or more spectrum management classes defined by a standard,</p>	<p>The infringing instrumentalities include a modem that is connected to a subscriber loop, the modem being capable of operating in one or more modes that are compatible with one or more spectrum management classes defined by a standard.</p> <p>Internet service providers such as Defendant uses network equipment called a DSLAM to provide xDSL services. Typically, the DSLAMs can deliver different types of xDSL services over the subscriber loop. A DSLAM includes one or more modems. DSLAMs are provided by vendors such as, for example, ADTRAN and ZyXEL.</p> <div style="display: flex; align-items: flex-start;">  <div style="margin-left: 20px;"> <p><b>Interfaces</b></p> <p><b>Network</b></p> <ul style="list-style-type: none"> <li>■ OC-3c</li> <li>■ DS3</li> <li>■ GIGE</li> <li>■ DS1 IMA</li> </ul> <p><b>Subscriber</b></p> <ul style="list-style-type: none"> <li>■ SHDSL 8 ports or 16 ports</li> <li>■ SHDSL IMA 16 ports</li> <li>■ SHDSL EFM 16 ports</li> <li>■ DSX-1 4 ports</li> <li>■ DS1 IMA 8 ports, dual wide card</li> <li>■ DS1 EFM 8 ports, dual wide card</li> <li>■ Voice Cell Processor 1 DS1 port</li> <li>■ DS3 Line Module 1 port</li> <li>■ Circuit Emulation 4 DS1 ports</li> <li>■ ADSL2+ 16 ports</li> <li>■ ADSL2+ with splitters 8 ports, dual wide card</li> <li>■ DS1 Frame Relay 4 ports</li> <li>■ MLPPP 4 ports</li> </ul> </div> </div> <p>BRANDYWINE 1 ATT 001037-1038.</p>

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		<div data-bbox="533 321 1003 1133">  </div> <div data-bbox="1037 315 1948 1133"> <p><b>Future Proof Next Generation Multi-Service IP Access Solution</b></p> <ul style="list-style-type: none"> <li>➤ 768 ports, 17 vertical slots with a maximum configuration of 1 MSC card and 16 Line cards</li> <li>➤ Multi-service interfaces including ADSL 2/2+, G.SHDSL.BIS, VDSL 2 and VOIP</li> <li>➤ IP-aware bridge to facilitate Mac address limitation and security breach of large-scale Layer 2 infrastructure deployment</li> <li>➤ Comprehensive QoS to enhance triple play users' experience</li> <li>➤ Field proven IGMP v1, v2 snooping and proxy for IPTV deployment</li> <li>➤ Flexible ACL, VLAN-aware DHCP and Anti-IP/MAC address spoofing to prevent malicious attack</li> <li>➤ DHCP option82 relay and ARP proxy build in to boost the stability of network</li> <li>➤ PPPoAoE, TACACS+ support for legacy routers remote authentication</li> <li>➤ Cluster management to reduce multiple DSLAM administration efforts via a single IP address</li> </ul> </div> <p>BRANDYWINE 1 ATT 001039.</p> <p>On information and belief, Defendant uses DSLAM equipment from the following suppliers to provide xDSL to its customers:</p> <ul style="list-style-type: none"> <li>• ADC</li> <li>• ADTRAN</li> <li>• Alcatel-Lucent</li> <li>• Calix</li> <li>• Ericsson</li> <li>• Motorola</li> <li>• Netgear</li> </ul>

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		<p>The company's three major product categories are Carrier Systems, Business Networking and Loop Access.</p> <p><b>Carrier Systems</b> includes broadband access products comprising Total Access (TA) 5000 multi-service access and aggregation platform products, Total Access 1100/1200 Series Fiber-To-The-Node (FTTN) products, Digital Subscriber Line Access Multiplexer (DSLAM) products, and Optical access products.</p> <p>Customer concentration is the major and foremost risk for the company. Customers such as AT&amp;T, Verizon, and CenturyLink generate a major portion of the company's revenue. As long as these giant and independent companies represent a substantial percentage of the company's sales, any reduction or loss in business from these customers could negatively impact revenue growth, thereby restricting the company's profitability.</p> <p>BRANDYWINE 1 ATT 000146-147.</p> <p>U-verse uses the Alcatel-Lucent 7330 or 7340 Intelligent Services Access Manager (ISAM) shelf, also called a video-ready access device (VRAD), deployed either in a central office (CO) or to a neighborhood serving area interface (SAI). These models are both composed of circuit boards providing service, which are fed by fiber. FTTN (fiber to the node) systems use model 7330, which uses existing copper wiring to customers' homes,<sup>[2]</sup> leading to distance limitations from the VRAD cabinet to the customer's home. The 7330 ISAM is an internet protocol DSL access multiplexer that supports VDSL and ADSL protocols.<sup>[11]</sup> FTTP (fiber to the premises) systems use model 7340, which is mostly used in areas such as new neighborhoods or large-scale developments where fiber can be run to the household, removing the distance limitations of copper. The 7340 then connects to a serving area interface, which distributes service to homes in the neighborhood, via a dual strand fiber, which is then split into 32 customer fiber pairs. The fiber pairs are typically led into a customer's residence at the network interface device.</p> <p>The VRAD typically connects upstream to an Alcatel-Lucent 7450 Ethernet service switch in the central office hub, then to the headend video hub office.<sup>[2]</sup></p>

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		<p>BRANDYWINE 1 ATT 000745.</p> <p>AT&amp;T uses Alcatel-Lucent VDSL2 equipment in most of their curb-side cabinets, which in turn are primarily fed data via fiber optics. This put AT&amp;T in a position to deliver their next generation of U-Verse on a VDSL technology, fiber optics, or a combination of the two. While it is unlikely that AT&amp;T will move to FTTH (Fiber To The Home) meaning a 100% fiber optic network such as <a href="#">Verizon's FiOS</a>, the do have plenty of options to consider that might offer impressive speed boosts to consumers.</p> <p>BRANDYWINE 1 ATT 000750.</p> <p>Ericsson is fulfilling its North American wireline dreams as AT&amp;T named the Swedish vendor as one of its main suppliers under its newly-created "Domain Supplier" Program. This development comes after reports emerged in June that AT&amp;T wanted to <b>reduce</b> its telecom vendor list. Through this program, Ericsson will be eligible to supply full system solutions for AT&amp;T's wireline access network, including IP/DSLAMs and Fiber to the X platforms.</p> <p>Ericsson said in a press release that with its GPON gear set for "general deployment, AT&amp;T will now embark on integrating Ericsson's DSL portfolio for Fiber to the Node (FTTN) and IP DSLAM solutions to support AT&amp;T's U-verse offerings, such as IPTV, High Speed Internet and VoIP over an all IP network infrastructure."</p> <p>BRANDYWINE 1 ATT 0001045.</p>

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		<p>The vendors said they signed a global reseller agreement where Calix will serve as Ericsson's "preferred global partner for broadband access applications." Through this arrangement, Calix's newly expanded Unified Access portfolio, including both GPON and VDSL2 copper-based solutions to 180 countries worldwide.</p> <p>BRANDYWINE 1 ATT 0001048.</p> <p>4. Defendants provide DSL modems to customers to transmit data from a customer's computer across the internet.</p> <p>5. Defendants are involved in determining the technical requirements for the DSL modems used and also for testing and deploying those modems but procure DSL modems from third-party vendors.</p> <p>6. Current DSL vendors for Defendants are Netgear, Inc., Motorola Mobility, and Pace plc. The modems from Pace are provided by Pace's subsidiary 2Wire, Inc.</p> <p>BRANDYWINE 1 ATT 000141.</p> <p>According to the ANSI T1.417 standard, the different types of DSL services operate under different spectrum management classes to avoid interfering with each other. See generally id. at 5.3.</p>



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		<p><b>5.5 Example systems of spectrum management classes</b></p> <p>Some example systems of spectrum management classes (SMC) are:</p> <ul style="list-style-type: none"> <li>– SMC 1: Basic Rate ISDN and SDSL with a line bit rate (LBR) satisfying <math>LBR \leq 288</math> kbps;</li> <li>– SMC 2: SDSL with an LBR satisfying <math>288 \text{ kbps} &lt; LBR \leq 528</math> kbps;</li> <li>– SMC 3: HDSL and SDSL with an LBR satisfying <math>528 \text{ kbps} &lt; LBR \leq 784</math> kbps;</li> <li>– SMC 4: HDSL2;</li> <li>– SMC 5: ADSL with non-overlapped spectra and RADSL;</li> <li>– SMC 6: VDSL;</li> <li>– SMC 7: SDSL with an LBR satisfying <math>1168 \text{ kbps} &lt; LBR \leq 1568</math> kbps;</li> <li>– SMC 8: SDSL with an LBR satisfying <math>784 \text{ kbps} &lt; LBR \leq 1168</math> kbps; and</li> <li>– SMC 9: ADSL with overlapped spectra.</li> </ul> <p>Id. at 5.5.</p> <p>Defendant provides xDSL services to competitive local exchange carriers ("CLECs"), and these services comply with spectrum management classes.</p> <p>When CLECs request a DSL capable loop, they must specify the PSD number associated with the Spectrum Management Class of the technology deployed over the loop. The NC/NCI combination input on the LSR indicates the PSD number.</p> <p>BRANDYWINE 1 ATT 001088.</p> <p><b>AT&amp;T Wholesale Agreement</b></p>

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		<p>The High Frequency Spectrum shall be available for any version of xDSL complying with Spectrum Management Class 5 of ANSI T1.417, American National Standard for Telecommunications, Spectrum Management for Loop Transmission Systems. BellSouth will continue to have access to the low frequency portion of the Loop spectrum (from 300 Hertz to at least 3000 Hertz, and potentially up to 3400 Hertz, depending on equipment and facilities) for the purposes of providing voice service. Level 3 shall only use xDSL technology that is within the PSD mask for Spectrum Management Class 5 as found in the abovementioned document.</p> <p>BRANDYWINE 1 ATT 001105; 1220.</p> <table border="1"> <thead> <tr> <th>Protocol</th><th>Protocol Option</th><th>Definition</th></tr> </thead> <tbody> <tr> <td>DU</td><td colspan="2">Digital Access Interface @ End User Premises</td></tr> <tr> <td></td><td></td><td>Cannot be ordered without a Protocol Option</td></tr> <tr> <td></td><td>001</td><td>Spectrum Management Class 1.</td></tr> <tr> <td></td><td>002</td><td>Spectrum Management Class 2.</td></tr> <tr> <td></td><td>003</td><td>Spectrum Management Class 3.</td></tr> <tr> <td></td><td>004</td><td>Spectrum Management Class 4.</td></tr> <tr> <td></td><td>005</td><td>Spectrum Management Class 5.</td></tr> <tr> <td></td><td>007</td><td>Spectrum Management Class 7.</td></tr> <tr> <td></td><td>008</td><td>Spectrum Management Class 8.</td></tr> <tr> <td></td><td>00A</td><td>ADSL Using Discrete Multi-Tone (DMT) format</td></tr> <tr> <td></td><td>00H</td><td>HDSL per <b>Ericsson (previously known as Telcordia Technologies)</b> TA-NWT-001210</td></tr> </tbody> </table>	Protocol	Protocol Option	Definition	DU	Digital Access Interface @ End User Premises				Cannot be ordered without a Protocol Option		001	Spectrum Management Class 1.		002	Spectrum Management Class 2.		003	Spectrum Management Class 3.		004	Spectrum Management Class 4.		005	Spectrum Management Class 5.		007	Spectrum Management Class 7.		008	Spectrum Management Class 8.		00A	ADSL Using Discrete Multi-Tone (DMT) format		00H	HDSL per <b>Ericsson (previously known as Telcordia Technologies)</b> TA-NWT-001210
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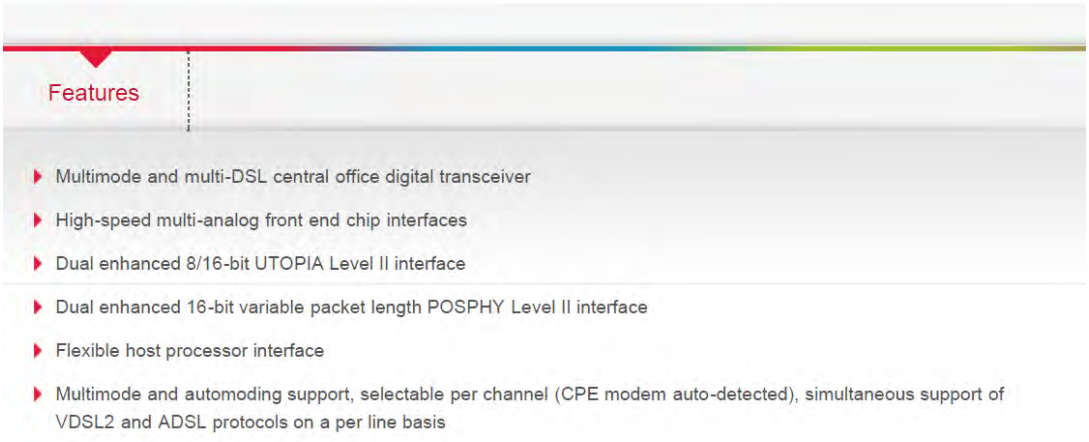
Claim No.	U.S. Pat. No. 6,970,501	Infringement		
		Protocol	Protocol Option	Definition
		QB		Central Office Manual Cross Connect Termination With No Sub-Rating Capability For Non-Multiplexed Facilities Only. (Note: can be, but not limited to Collocation)
				Cannot be ordered without a Protocol Option
			00	MDF Cross-Connect
			001	Spectrum Management Class 1 w/unspecified cross connect cable shielding requirements.
			002	Spectrum Management Class 2 w/unspecified cross connect cable shielding requirements.
			003	Spectrum Management Class 3 w/unspecified cross connect cable shielding requirements.
			004	Spectrum Management Class 4 w/unspecified cross connect cable shielding requirements.
			005	Spectrum Management Class 5 w/unspecified cross connect cable shielding requirements.
			007	Spectrum Management Class 7 w/unspecified cross connect cable shielding requirements.
			008	Spectrum Management Class 8 w/unspecified cross connect cable shielding requirements. (Available in East region only)
		BRANDYWINE 1 ATT 001063; 1072.		
	each spectrum management class defining power spectral density (PSD) requirements,	The infringing instrumentalities include a modem that is compatible with one or more spectrum management classes, each spectrum management class defining power spectral density (PSD) requirements.  The T1.417 standard defines the multiple spectrum management classes, each with different PSD requirements. T1.417 at 1.1, 5.3.1.1, 5.3.2.1.		
	the modem being configured to automatically select a	The infringing instrumentalities include a modem that is configured to automatically select a mode that is compatible with at least one of the spectrum management classes.		

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	mode that is compatible with at least one of the spectrum management classes;	<p>Defendant's DSLAM equipment can operate in a number of xDSL modes. For example, certain DSLAMs may implement a selection mechanism for a given type of DSL protocol.</p> <p><b>Operating Mode Selection Mechanism for ADSLx</b></p> <p>Depending on the supported operating modes by the ATU-R, the ATU-C will give priorities according to following list, assuming the operator allowed all supported operating modes to be executed :</p> <ol style="list-style-type: none"> <li>1. G.992.5 (ADSL2plus), Annex M</li> <li>2. G.992.3 (ADSL2), Annex M</li> <li>3. G.992.5 (ADSL2plus), Annex A or B (exclusive)</li> <li>4. G.992.3 (ADSL2), Annex A or L (*), or B (exclusive)</li> <li>5. G.992.1 (ADSL), Annex A or B (exclusive)</li> <li>6. G.992.2 (ADSL-lite), Annex A</li> <li>7. T.413 (ANSI-ADSL) or ETS 101 388 Annex C (exclusive)</li> </ol> <p>(*) When the ATU-R supports as well G.992.3 Annex L (READSL2), then priority selection between Annex A and Annex L is configurable by operator, and based on optimising the downstream or the upstream bitrate.</p> <p>BRANDYWINE 1 ATT 001373.</p> <p>Certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, such functionalities are implemented in chip logic and/or software.</p>



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		<p><b>Multi-DSL Transceiver</b></p> <p>The BCM6519 is a multimode and multidensity DSL transceiver and an advanced and flexible solution for DSLAM, MSAN and FTTx deployments.</p> <p>This DSL DSP can be combined with Broadcom's low power analog front end devices to enable all combinations of ADSL2+ line cards, multi-DSL line cards, and VDSL2-only line cards up to profile 30a.</p> <p>Request Product Info to learn more about Broadcom products or contact a <b>Manufacturer Representative</b> in your area.</p>  <p>BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
	a plurality of transceivers, each transceiver corresponding to one of the modes, wherein the modem electrically couples a corresponding	<p>The infringing instrumentalities include a plurality of transceivers, each transceiver corresponding to one of the modes, wherein the modem electrically couples a corresponding transceiver to the subscriber loop upon selecting one of the modes.</p> <p>Defendant's DSLAMs include a plurality of selectable transceivers. Typically, the DSLAM is a rack-mounted device that can house as many as 500 transceivers. The DSLAM holds removable circuit cards, each containing a plurality of transceivers.</p>







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	transceiver to the subscriber loop upon selecting one of the modes;	<div data-bbox="537 483 1247 906"> </div> <p data-bbox="525 933 934 958">BRANDYWINE 1 ATT 001037-1038.</p> <div data-bbox="1312 310 1444 337"> <b>Interfaces</b> </div> <div data-bbox="1312 345 1411 373"> <b>Network</b> </div> <div data-bbox="1333 378 1627 440"> <ul style="list-style-type: none"> <li>■ OC-3c                      ■ DS3</li> <li>■ GIGE                        ■ DS1 IMA</li> </ul> </div> <div data-bbox="1312 451 1434 479"> <b>Subscriber</b> </div> <div data-bbox="1333 483 1843 922"> <ul style="list-style-type: none"> <li>■ SHDSL                      8 ports or 16 ports</li> <li>■ SHDSL IMA                16 ports</li> <li>■ SHDSL EFM               16 ports</li> <li>■ DSX-1                       4 ports</li> <li>■ DS1 IMA                    8 ports, dual wide card</li> <li>■ DS1 EFM                   8 ports, dual wide card</li> <li>■ Voice Cell Processor      1 DS1 port</li> <li>■ DS3 Line Module          1 port</li> <li>■ Circuit Emulation         4 DS1 ports</li> <li>■ ADSL2+                    16 ports</li> <li>■ ADSL2+ with splitters    8 ports, dual wide card</li> <li>■ DS1 Frame Relay          4 ports</li> <li>■ MLPPP                     4 ports</li> </ul> </div>

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		<p>The company's three major product categories are Carrier Systems, Business Networking and Loop Access.</p> <p><b>Carrier Systems</b> includes broadband access products comprising Total Access (TA) 5000 multi-service access and aggregation platform products, Total Access 1100/1200 Series Fiber-To-The-Node (FTTN) products, Digital Subscriber Line Access Multiplexer (DSLAM) products, and Optical access products.</p> <p>Customer concentration is the major and foremost risk for the company. Customers such as AT&amp;T, Verizon, and CenturyLink generate a major portion of the company's revenue. As long as these giant and independent companies represent a substantial percentage of the company's sales, any reduction or loss in business from these customers could negatively impact revenue growth, thereby restricting the company's profitability.</p> <p>BRANDYWINE 1 ATT 000146-147.</p> <p>U-verse uses the Alcatel-Lucent 7330 or 7340 Intelligent Services Access Manager (ISAM) shelf, also called a video-ready access device (VRAD), deployed either in a central office (CO) or to a neighborhood serving area interface (SAI). These models are both composed of circuit boards providing service, which are fed by fiber. FTTN (fiber to the node) systems use model 7330, which uses existing copper wiring to customers' homes,<sup>[2]</sup> leading to distance limitations from the VRAD cabinet to the customer's home. The 7330 ISAM is an internet protocol DSL access multiplexer that supports VDSL and ADSL protocols.<sup>[11]</sup> FTTP (fiber to the premises) systems use model 7340, which is mostly used in areas such as new neighborhoods or large-scale developments where fiber can be run to the household, removing the distance limitations of copper. The 7340 then connects to a serving area interface, which distributes service to homes in the neighborhood, via a dual strand fiber, which is then split into 32 customer fiber pairs. The fiber pairs are typically led into a customer's residence at the network interface device.</p> <p>The VRAD typically connects upstream to an Alcatel-Lucent 7450 Ethernet service switch in the central office hub, then to the headend video hub office.<sup>[2]</sup></p>



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		<p>BRANDYWINE 1 ATT 000745.</p> <p>AT&amp;T uses Alcatel-Lucent VDSL2 equipment in most of their curb-side cabinets, which in turn are primarily fed data via fiber optics. This put AT&amp;T in a position to deliver their next generation of U-Verse on a VDSL technology, fiber optics, or a combination of the two. While it is unlikely that AT&amp;T will move to FTTH (Fiber To The Home) meaning a 100% fiber optic network such as <a href="#">Verizon's FiOS</a>, the do have plenty of options to consider that might offer impressive speed boosts to consumers.</p> <p>BRANDYWINE 1 ATT 000750.</p> <p>Ericsson is fulfilling its North American wireline dreams as AT&amp;T named the Swedish vendor as one of its main suppliers under its newly-created "Domain Supplier" Program. This development comes after reports emerged in June that AT&amp;T wanted to <b>reduce</b> its telecom vendor list. Through this program, Ericsson will be eligible to supply full system solutions for AT&amp;T's wireline access network, including IP/DSLAMs and Fiber to the X platforms.</p> <p>Ericsson said in a press release that with its GPON gear set for "general deployment, AT&amp;T will now embark on integrating Ericsson's DSL portfolio for Fiber to the Node (FTTN) and IP DSLAM solutions to support AT&amp;T's U-verse offerings, such as IPTV, High Speed Internet and VoIP over an all IP network infrastructure."</p> <p>BRANDYWINE 1 ATT 0001045.</p>



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		<p>The vendors said they signed a global reseller agreement where Calix will serve as Ericsson's "preferred global partner for broadband access applications." Through this arrangement, Calix's newly expanded Unified Access portfolio, including both GPON and VDSL2 copper-based solutions to 180 countries worldwide.</p> <p>BRANDYWINE 1 ATT 0001048.</p> <p>4. Defendants provide DSL modems to customers to transmit data from a customer's computer across the internet.</p> <p>5. Defendants are involved in determining the technical requirements for the DSL modems used and also for testing and deploying those modems but procure DSL modems from third-party vendors.</p> <p>6. Current DSL vendors for Defendants are Netgear, Inc., Motorola Mobility, and Pace plc. The modems from Pace are provided by Pace's subsidiary 2Wire, Inc.</p> <p>BRANDYWINE 1 ATT 000141.</p> <p>On information and belief, Defendant's OSS or other equipment can couple a transceiver corresponding to a mode of operation, for example allow one transceiver to failover to another in the event that the first transceiver malfunctions. On information and belief, Defendant's OSS or other equipment uses information stored in the management information base to select an operating transceiver for a local loop. G.997.1 at 7.3.1.1.1.</p>

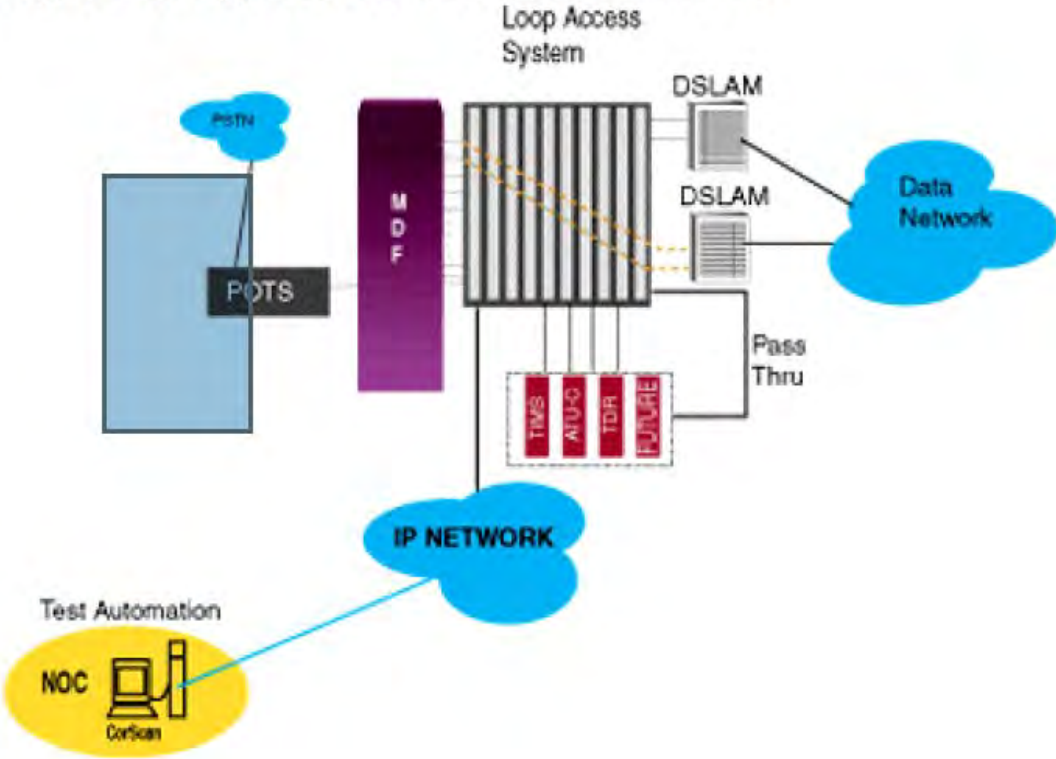
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		<p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a subscriber loop. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
	<p>a selector, the selector selecting one of the transceivers to be electrically coupled to the subscriber loop; and</p>	<p>The infringing instrumentalities include a selector, which is capable of selecting one of the transceivers to be electrically coupled to the subscriber loop.</p> <p>On information and belief, Defendant's equipment includes a plurality of selectable transceivers that can operate over a subscriber loop. For example, Defendant's OSS or other equipment can couple a transceiver corresponding to a mode of operation, for example allow one transceiver to failover to another in the event that the first transceiver malfunctions. On information and belief, Defendant's OSS or other equipment uses information stored in the management information base to select an operating transceiver for a local loop. G.997.1 at 7.3.1.1.1.</p> <p>OSS systems are provided by vendors such as, for example, Oracle Corporation.</p> <div data-bbox="522 980 1113 1364">  <p>The logo for Oracle Communications MetaSolv Solution. It features the word "ORACLE" in red, "COMMUNICATIONS" in black, and "MetaSolv Solution" in red. Below the text is a 3D cube with four colored faces (yellow, blue, green, red) and a small globe on top.</p> </div> <p><b><u>Solution Capability</u></b></p> <ul style="list-style-type: none"> <li>• Enterprise-wide inventory convergence</li> <li>• Domain-specific: e.g. Optical, IP, Mobile, TDM, HFC, etc.</li> <li>• Order-to-Activate for VoIP and IP VPN</li> <li>• Task management through integrated work queues and assignments</li> <li>• Automation of provisioning process</li> </ul> <p>BRANDYWINE 1 ATT 001009; 1013.</p> <p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a</p>

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		<p>subscriber loop. For example, certain DSLAMs may implement a selection mechanism for a given type of DSL protocol. BRANDYWINE 1 ATT 001373. Certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
	<p>an Automatic Class Measurement device in communication with the selector, the Automatic Class Measurement device being configured to automatically select a mode that is compatible with at least one of the spectrum management classes and to cause the selector to select one of the transceivers to be electrically coupled to the subscriber loop.</p>	<p>The infringing instrumentalities include an Automatic Class Measurement device in communication with the selector, the Automatic Class Measurement device being configured to automatically select a mode that is compatible with at least one of the spectrum management classes and to cause the selector to select one of the transceivers to be electrically coupled to the subscriber loop.</p> <p>On information and belief, Defendant operates a test environment in which it can perform loop qualification tests on the local loops.</p>

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		<p><b>Figure 1. Typical CO Test Environment</b></p>  <p>BRANDYWINE 1 ATT 000995.</p> <p>The testing environment comprises a test head in the exchange office which can, with control from an OSS, connect to the DSLAM or individual loops connected to the DSLAM. Id. The OSS, with access to the test heads, are able to perform tests that can determine available line speeds based on loop lengths and other loop characteristic parameters. BRANDYWINE 1 ATT 000997-998. The OSS may also monitor the spectral interference on a line. BRANDYWINE 1 ATT 000998.</p> <p>OSS systems are provided by vendors such as, for example, Oracle Corporation.</p>

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Claim No.	U.S. Pat. No. 6,970,501	Infringement
		<div data-bbox="525 310 1115 691" data-label="Image"> <p>The logo for Oracle Communications MetaSolv Solution. It features the word "ORACLE" in red, "COMMUNICATIONS" in black, and "MetaSolv Solution" in red. Below the text is a graphic of a 3D cube with four colored faces (yellow, blue, green, red) and a central sphere.</p> </div> <p><b><u>Solution Capability</u></b></p> <ul style="list-style-type: none"> <li>• Enterprise-wide inventory convergence</li> <li>• Domain-specific: e.g. Optical, IP, Mobile, TDM, HFC, etc.</li> <li>• Order-to-Activate for VoIP and IP VPN</li> <li>• Task management through integrated work queues and assignments</li> <li>• Automation of provisioning process</li> </ul> <p>BRANDYWINE 1 ATT 001009; 1013.</p> <p>On information and belief, Defendant's OSS is able to periodically test the subscriber line characteristics, determine the xDSL modes that allowable on the subscriber line, and select a transceiver to be used on the subscriber line.</p> <p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a subscriber loop. For example, certain DSLAMs may implement a selection mechanism for a given type of DSL protocol. BRANDYWINE 1 ATT 001373. Certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
3	The apparatus of claim 1, wherein the modem is further configured to automatically select a mode that is compatible with at least one of the spectrum management	<p>The infringing instrumentalities are configured to automatically select a mode that is compatible with at least one of the spectrum management classes by measuring subscriber loop length.</p> <p>Defendant's OSS and testing equipment is able to measure loop characteristics, including loop length. BRANDYWINE 1 ATT 000997-998. The OSS, with access to the test heads, are able to perform tests that can determine available line speeds based on loop lengths and other loop characteristic parameters. BRANDYWINE 1 ATT 000997-998. On information and belief, Defendant's OSS saves the loop length and other loop characteristics information in a database.</p>




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	classes by measuring subscriber loop length.	<p>Defendant offers automatic loop qualification results for its CLECs and other customers to determine whether certain modes are available over certain loops. The qualification process involves determining the loop length either through measurement with a test head or by use of loop information stored in an OSS database. BRANDYWINE 1 ATT 000997-998.</p> <p>On information and belief, Defendant's OSS or DSLAMs are able to perform tests that can determine available line speeds based on loop lengths and other loop characteristic parameters. BRANDYWINE 1 ATT 000997-998.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
5	An apparatus comprising:	The infringing instrumentalities include, for example, Defendant's modems and/or digital subscriber line access multiplexers, which include transceivers for communicating over the subscriber loop, line testing equipment, along with the OSS for control, monitoring and testing DSLAMs.
	a modem connected to a subscriber loop, the modem being capable of operating in one or more modes that are compatible with one or more spectrum management classes defined by a standard,	<p>The infringing instrumentalities include a modem connected to a subscriber loop, the modem being capable of operating in one or more modes that are compatible with one or more spectrum management classes defined by a standard.</p> <p>Internet service providers such as Defendant use network equipment called a DSLAM to provide DSL services. Typically, the DSLAMs can deliver different types of xDSL services over the subscriber loop. A DSLAM includes one or more modems. DSLAMs are provided by vendors such as, for example, ADTRAN and ZyXEL.</p>



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		<div data-bbox="533 321 1003 1133">  </div> <div data-bbox="1037 315 1948 1133"> <p><b>Future Proof Next Generation Multi-Service IP Access Solution</b></p> <ul style="list-style-type: none"> <li>➤ 768 ports, 17 vertical slots with a maximum configuration of 1 MSC card and 16 Line cards</li> <li>➤ Multi-service interfaces including ADSL 2/2+, G.SHDSL.BIS, VDSL 2 and VOIP</li> <li>➤ IP-aware bridge to facilitate Mac address limitation and security breach of large-scale Layer 2 infrastructure deployment</li> <li>➤ Comprehensive QoS to enhance triple play users' experience</li> <li>➤ Field proven IGMP v1, v2 snooping and proxy for IPTV deployment</li> <li>➤ Flexible ACL, VLAN-aware DHCP and Anti-IP/MAC address spoofing to prevent malicious attack</li> <li>➤ DHCP option82 relay and ARP proxy build in to boost the stability of network</li> <li>➤ PPPoAoE, TACACS+ support for legacy routers remote authentication</li> <li>➤ Cluster management to reduce multiple DSLAM administration efforts via a single IP address</li> </ul> </div> <p>BRANDYWINE 1 ATT 001039.</p> <p>On information and belief, Defendant uses DSLAM equipment from the following suppliers to provide xDSL to its customers:</p> <ul style="list-style-type: none"> <li>• ADC</li> <li>• ADTRAN</li> <li>• Alcatel-Lucent</li> <li>• Calix</li> <li>• Ericsson</li> <li>• Motorola</li> </ul>

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Claim No.	U.S. Pat. No. 6,970,501	Infringement
		<ul style="list-style-type: none"> <li>• Netgear</li> <li>• Pace</li> </ul> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p><b>H2TU-C-319</b></p>  <p>Product Catalog: H2TU-C-319-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-C-231</b></p>  <p>Product Catalog: H2TU-C-231-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-C-388</b></p>  <p>Product Catalog: H2TU-C-388-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-R-402</b></p>  <p>Product Catalog: H2TU-R-402-L7F/L7Fx</p> </div> </div> <p>BRANDYWINE 1 ATT 000776.</p>



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		<p>The company's three major product categories are Carrier Systems, Business Networking and Loop Access.</p> <p><b>Carrier Systems</b> includes broadband access products comprising Total Access (TA) 5000 multi-service access and aggregation platform products, Total Access 1100/1200 Series Fiber-To-The-Node (FTTN) products, Digital Subscriber Line Access Multiplexer (DSLAM) products, and Optical access products.</p> <p>Customer concentration is the major and foremost risk for the company. Customers such as AT&amp;T, Verizon, and CenturyLink generate a major portion of the company's revenue. As long as these giant and independent companies represent a substantial percentage of the company's sales, any reduction or loss in business from these customers could negatively impact revenue growth, thereby restricting the company's profitability.</p> <p>BRANDYWINE 1 ATT 000146-147.</p> <p>U-verse uses the Alcatel-Lucent 7330 or 7340 Intelligent Services Access Manager (ISAM) shelf, also called a video-ready access device (VRAD), deployed either in a central office (CO) or to a neighborhood serving area interface (SAI). These models are both composed of circuit boards providing service, which are fed by fiber. FTTN (fiber to the node) systems use model 7330, which uses existing copper wiring to customers' homes,<sup>[2]</sup> leading to distance limitations from the VRAD cabinet to the customer's home. The 7330 ISAM is an internet protocol DSL access multiplexer that supports VDSL and ADSL protocols.<sup>[11]</sup> FTTP (fiber to the premises) systems use model 7340, which is mostly used in areas such as new neighborhoods or large-scale developments where fiber can be run to the household, removing the distance limitations of copper. The 7340 then connects to a serving area interface, which distributes service to homes in the neighborhood, via a dual strand fiber, which is then split into 32 customer fiber pairs. The fiber pairs are typically led into a customer's residence at the network interface device.</p> <p>The VRAD typically connects upstream to an Alcatel-Lucent 7450 Ethernet service switch in the central office hub, then to the headend video hub office.<sup>[2]</sup></p>



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		<p>BRANDYWINE 1 ATT 000745.</p> <p>AT&amp;T uses Alcatel-Lucent VDSL2 equipment in most of their curb-side cabinets, which in turn are primarily fed data via fiber optics. This put AT&amp;T in a position to deliver their next generation of U-Verse on a VDSL technology, fiber optics, or a combination of the two. While it is unlikely that AT&amp;T will move to FTTH (Fiber To The Home) meaning a 100% fiber optic network such as <a href="#">Verizon's FiOS</a>, the do have plenty of options to consider that might offer impressive speed boosts to consumers.</p> <p>BRANDYWINE 1 ATT 000750.</p> <p>Ericsson is fulfilling its North American wireline dreams as AT&amp;T named the Swedish vendor as one of its main suppliers under its newly-created "Domain Supplier" Program. This development comes after reports emerged in June that AT&amp;T wanted to <b>reduce</b> its telecom vendor list. Through this program, Ericsson will be eligible to supply full system solutions for AT&amp;T's wireline access network, including IP/DSLAMs and Fiber to the X platforms.</p> <p>Ericsson said in a press release that with its GPON gear set for "general deployment, AT&amp;T will now embark on integrating Ericsson's DSL portfolio for Fiber to the Node (FTTN) and IP DSLAM solutions to support AT&amp;T's U-verse offerings, such as IPTV, High Speed Internet and VoIP over an all IP network infrastructure."</p> <p>BRANDYWINE 1 ATT 0001045.</p>

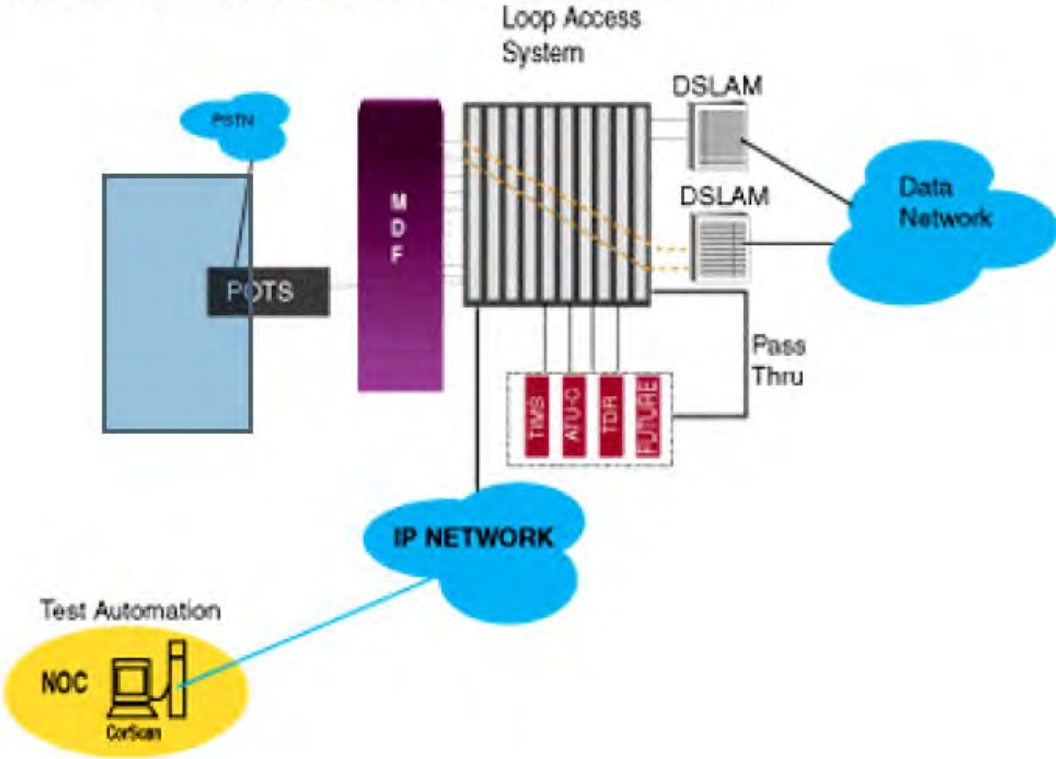
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		<p>The vendors said they signed a global reseller agreement where Calix will serve as Ericsson's "preferred global partner for broadband access applications." Through this arrangement, Calix's newly expanded Unified Access portfolio, including both GPON and VDSL2 copper-based solutions to 180 countries worldwide.</p> <p>BRANDYWINE 1 ATT 0001048.</p> <p>4. Defendants provide DSL modems to customers to transmit data from a customer's computer across the internet.</p> <p>5. Defendants are involved in determining the technical requirements for the DSL modems used and also for testing and deploying those modems but procure DSL modems from third-party vendors.</p> <p>6. Current DSL vendors for Defendants are Netgear, Inc., Motorola Mobility, and Pace plc. The modems from Pace are provided by Pace's subsidiary 2Wire, Inc.</p> <p>BRANDYWINE 1 ATT 000141.</p> <p>According to the ANSI T1.417 standard, the different types of DSL services operate under different spectrum management classes to avoid interfering with each other. See generally id. at 5.3.</p>

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		<p><b>5.5 Example systems of spectrum management classes</b></p> <p>Some example systems of spectrum management classes (SMC) are:</p> <ul style="list-style-type: none"> <li>– SMC 1: Basic Rate ISDN and SDSL with a line bit rate (LBR) satisfying <math>LBR \leq 288</math> kbps;</li> <li>– SMC 2: SDSL with an LBR satisfying <math>288 \text{ kbps} &lt; LBR \leq 528</math> kbps;</li> <li>– SMC 3: HDSL and SDSL with an LBR satisfying <math>528 \text{ kbps} &lt; LBR \leq 784</math> kbps;</li> <li>– SMC 4: HDSL2;</li> <li>– SMC 5: ADSL with non-overlapped spectra and RADSL;</li> <li>– SMC 6: VDSL;</li> <li>– SMC 7: SDSL with an LBR satisfying <math>1168 \text{ kbps} &lt; LBR \leq 1568</math> kbps;</li> <li>– SMC 8: SDSL with an LBR satisfying <math>784 \text{ kbps} &lt; LBR \leq 1168</math> kbps; and</li> <li>– SMC 9: ADSL with overlapped spectra.</li> </ul> <p>Id. at 5.5.</p> <p>On information and belief, Defendant provides xDSL services on subscriber loops and its xDSL equipment comply with these predefined spectrum management classes. For example, Defendant can pre-qualify its local loops for particular xDSL service. BRANDYWINE 1 ATT 001093.</p>
	each spectrum management class defining power spectral density (PSD) requirements,	<p>The infringing instrumentalities include a modem that is compatible with one or more spectrum management classes, each spectrum management class defining power spectral density (PSD) requirements.</p> <p>The T1.417 standard defines the multiple spectrum management classes, each with different PSD requirements. T1.417 at 1.1, 5.3.1.1, 5.3.2.1.</p>
	the modem being configured to measure characteristics of the subscriber loop,	<p>The infringing instrumentalities include a modem that is configured to measure characteristics of the subscriber loop.</p> <p>On information and belief, Defendant operates a test environment in which it can perform loop qualification tests on the local loops.</p>

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		<p><b>Figure 1. Typical CO Test Environment</b></p>  <p>BRANDYWINE 1 ATT 000995.</p> <p>The testing environment comprises a test head in the exchange office which can, with control from an OSS, connect to the DSLAM or individual loops connected to the DSLAM. Id. The OSS, with access to the test heads, are able to perform tests that can determine available line speeds based on loop lengths and other loop characteristic parameters. BRANDYWINE 1 ATT 000997-998. The OSS may also monitor the spectral interference on a line. BRANDYWINE 1 ATT 000998.</p> <p>OSS systems are provided by vendors such as, for example, Oracle Corporation.</p>

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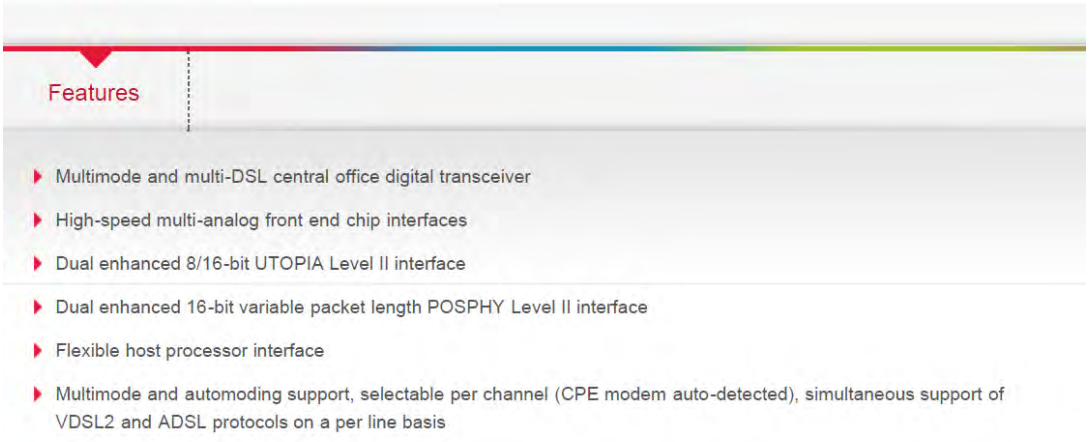
Claim No.	U.S. Pat. No. 6,970,501	Infringement
		<div data-bbox="525 311 1115 691" data-label="Image"> <p>The logo for Oracle Communications MetaSolv Solution. It features the word "ORACLE" in red, "COMMUNICATIONS" in black, and "MetaSolv Solution" in red. Below the text is a 3D graphic of a cube with four colored faces (yellow, blue, green, red) and a silver sphere in the center.</p> </div> <p>BRANDYWINE 1 ATT 001009; 1013.</p> <p>In addition, on information and belief, the DSLAM itself has the capability to measure characteristics of the subscriber loop. For example, certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, such functionalities are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
	<p>the modem being further configured to automatically select, based on the measured characteristics, a mode that is compatible with at least one of the spectrum management classes;</p>	<p>The infringing instrumentalities include a modem that is configured to automatically select, based on the measured characteristics, a mode that is compatible with at least one of the spectrum management classes.</p> <p>Defendant's DSLAM equipment can operate in a number of xDSL modes. For example, certain DSLAMs may implement a selection mechanism for a given type of DSL protocol.</p>



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		<p><b>Operating Mode Selection Mechanism for ADSLx</b></p> <p>Depending on the supported operating modes by the ATU-R, the ATU-C will give priorities according to following list, assuming the operator allowed all supported operating modes to be executed :</p> <ol style="list-style-type: none"> <li>1. G.992.5 (ADSL2plus), Annex M</li> <li>2. G.992.3 (ADSL2), Annex M</li> <li>3. G.992.5 (ADSL2plus), Annex A or B (exclusive)</li> <li>4. G.992.3 (ADSL2), Annex A or L (*), or B (exclusive)</li> <li>5. G.992.1 (ADSL), Annex A or B (exclusive)</li> <li>6. G.992.2 (ADSL-lite), Annex A</li> <li>7. T.413 (ANSI-ADSL) or ETS 101 388 Annex C (exclusive)</li> </ol> <p>(*) When the ATU-R supports as well G.992.3 Annex L (READSL2), then priority selection between Annex A and Annex L is configurable by operator, and based on optimising the downstream or the upstream bitrate.</p> <p>BRANDYWINE 1 ATT 001373.</p> <p>Certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, such functionalities are implemented in chip logic and/or software.</p>


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		<p><b>Multi-DSL Transceiver</b></p> <p>The BCM6519 is a multimode and multidensity DSL transceiver and an advanced and flexible solution for DSLAM, MSAN and FTTx deployments.</p> <p>This DSL DSP can be combined with Broadcom's low power analog front end devices to enable all combinations of ADSL2+ line cards, multi-DSL line cards, and VDSL2-only line cards up to profile 30a.</p> <p>Request Product Info to learn more about Broadcom products or contact a <b>Manufacturer Representative</b> in your area.</p>  <p>BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
	a plurality of transceivers, each transceiver corresponding to one of the modes, wherein the modem electrically couples the	<p>The infringing instrumentalities include a plurality of transceivers, each transceiver corresponding to one of the modes, wherein the modem electrically couples the corresponding transceiver of the modem to the subscriber loop upon selecting a mode.</p> <p>Defendant's DSLAMs include a plurality of selectable transceivers. Typically, the DSLAM is a rack-mounted device that can house as many as 500 transceivers. The DSLAM holds removable circuit cards, each containing a plurality of transceivers.</p>

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	corresponding transceiver of the modem to the subscriber loop upon selecting a mode;	<div data-bbox="537 483 1247 906" data-label="Image"> </div> <p data-bbox="525 933 934 961">BRANDYWINE 1 ATT 001037-1038.</p> <div data-bbox="1312 310 1444 337" data-label="Section-Header"> <h3>Interfaces</h3> </div> <div data-bbox="1312 345 1411 373" data-label="Section-Header"> <h4>Network</h4> </div> <div data-bbox="1333 378 1627 440" data-label="List-Group"> <ul style="list-style-type: none"> <li>■ OC-3c</li> <li>■ DS3</li> <li>■ GIGE</li> <li>■ DS1 IMA</li> </ul> </div> <div data-bbox="1312 451 1436 479" data-label="Section-Header"> <h4>Subscriber</h4> </div> <div data-bbox="1333 483 1843 922" data-label="List-Group"> <ul style="list-style-type: none"> <li>■ SHDSL 8 ports or 16 ports</li> <li>■ SHDSL IMA 16 ports</li> <li>■ SHDSL EFM 16 ports</li> <li>■ DSX-1 4 ports</li> <li>■ DS1 IMA 8 ports, dual wide card</li> <li>■ DS1 EFM 8 ports, dual wide card</li> <li>■ Voice Cell Processor 1 DS1 port</li> <li>■ DS3 Line Module 1 port</li> <li>■ Circuit Emulation 4 DS1 ports</li> <li>■ ADSL2+ 16 ports</li> <li>■ ADSL2+ with splitters 8 ports, dual wide card</li> <li>■ DS1 Frame Relay 4 ports</li> <li>■ MLPPP 4 ports</li> </ul> </div>

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		<div data-bbox="533 321 1003 1133">  </div> <div data-bbox="1037 315 1948 1133"> <p><b>Future Proof Next Generation Multi-Service IP Access Solution</b></p> <ul style="list-style-type: none"> <li>➤ 768 ports, 17 vertical slots with a maximum configuration of 1 MSC card and 16 Line cards</li> <li>➤ Multi-service interfaces including ADSL 2/2+, G.SHDSL.BIS, VDSL 2 and VOIP</li> <li>➤ IP-aware bridge to facilitate Mac address limitation and security breach of large-scale Layer 2 infrastructure deployment</li> <li>➤ Comprehensive QoS to enhance triple play users' experience</li> <li>➤ Field proven IGMP v1, v2 snooping and proxy for IPTV deployment</li> <li>➤ Flexible ACL, VLAN-aware DHCP and Anti-IP/MAC address spoofing to prevent malicious attack</li> <li>➤ DHCP option82 relay and ARP proxy build in to boost the stability of network</li> <li>➤ PPPoAoE, TACACS+ support for legacy routers remote authentication</li> <li>➤ Cluster management to reduce multiple DSLAM administration efforts via a single IP address</li> </ul> </div> <p>BRANDYWINE 1 ATT 001039.</p> <p>On information and belief, Defendant uses DSLAM equipment from the following suppliers to provide xDSL to its customers:</p> <ul style="list-style-type: none"> <li>• ADC</li> <li>• ADTRAN</li> <li>• Alcatel-Lucent</li> <li>• Calix</li> <li>• Ericsson</li> <li>• Motorola</li> </ul>



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Claim No.	U.S. Pat. No. 6,970,501	Infringement
		<ul style="list-style-type: none"> <li>• Netgear</li> <li>• Pace</li> </ul> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p><b>H2TU-C-319</b></p>  <p>Product Catalog: H2TU-C-319-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-C-231</b></p>  <p>Product Catalog: H2TU-C-231-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-C-388</b></p>  <p>Product Catalog: H2TU-C-388-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-R-402</b></p>  <p>Product Catalog: H2TU-R-402-L7F/L7Fx</p> </div> </div> <p>BRANDYWINE 1 ATT 000776.</p>



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		<p>The company's three major product categories are Carrier Systems, Business Networking and Loop Access.</p> <p><b>Carrier Systems</b> includes broadband access products comprising Total Access (TA) 5000 multi-service access and aggregation platform products, Total Access 1100/1200 Series Fiber-To-The-Node (FTTN) products, Digital Subscriber Line Access Multiplexer (DSLAM) products, and Optical access products.</p> <p>Customer concentration is the major and foremost risk for the company. Customers such as AT&amp;T, Verizon, and CenturyLink generate a major portion of the company's revenue. As long as these giant and independent companies represent a substantial percentage of the company's sales, any reduction or loss in business from these customers could negatively impact revenue growth, thereby restricting the company's profitability.</p> <p>BRANDYWINE 1 ATT 000146-147.</p> <p>U-verse uses the Alcatel-Lucent 7330 or 7340 Intelligent Services Access Manager (ISAM) shelf, also called a video-ready access device (VRAD), deployed either in a central office (CO) or to a neighborhood serving area interface (SAI). These models are both composed of circuit boards providing service, which are fed by fiber. FTTN (fiber to the node) systems use model 7330, which uses existing copper wiring to customers' homes,<sup>[2]</sup> leading to distance limitations from the VRAD cabinet to the customer's home. The 7330 ISAM is an internet protocol DSL access multiplexer that supports VDSL and ADSL protocols.<sup>[11]</sup> FTTP (fiber to the premises) systems use model 7340, which is mostly used in areas such as new neighborhoods or large-scale developments where fiber can be run to the household, removing the distance limitations of copper. The 7340 then connects to a serving area interface, which distributes service to homes in the neighborhood, via a dual strand fiber, which is then split into 32 customer fiber pairs. The fiber pairs are typically led into a customer's residence at the network interface device.</p> <p>The VRAD typically connects upstream to an Alcatel-Lucent 7450 Ethernet service switch in the central office hub, then to the headend video hub office.<sup>[2]</sup></p>


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		<p>BRANDYWINE 1 ATT 000745.</p> <p>AT&amp;T uses Alcatel-Lucent VDSL2 equipment in most of their curb-side cabinets, which in turn are primarily fed data via fiber optics. This put AT&amp;T in a position to deliver their next generation of U-Verse on a VDSL technology, fiber optics, or a combination of the two. While it is unlikely that AT&amp;T will move to FTTH (Fiber To The Home) meaning a 100% fiber optic network such as <a href="#">Verizon's FiOS</a>, the do have plenty of options to consider that might offer impressive speed boosts to consumers.</p> <p>BRANDYWINE 1 ATT 000750.</p> <p>Ericsson is fulfilling its North American wireline dreams as AT&amp;T named the Swedish vendor as one of its main suppliers under its newly-created "Domain Supplier" Program. This development comes after reports emerged in June that AT&amp;T wanted to <b>reduce</b> its telecom vendor list. Through this program, Ericsson will be eligible to supply full system solutions for AT&amp;T's wireline access network, including IP/DSLAMs and Fiber to the X platforms.</p> <p>Ericsson said in a press release that with its GPON gear set for "general deployment, AT&amp;T will now embark on integrating Ericsson's DSL portfolio for Fiber to the Node (FTTN) and IP DSLAM solutions to support AT&amp;T's U-verse offerings, such as IPTV, High Speed Internet and VoIP over an all IP network infrastructure."</p> <p>BRANDYWINE 1 ATT 0001045.</p>

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		<p>The vendors said they signed a global reseller agreement where Calix will serve as Ericsson's "preferred global partner for broadband access applications." Through this arrangement, Calix's newly expanded Unified Access portfolio, including both GPON and VDSL2 copper-based solutions to 180 countries worldwide.</p> <p>BRANDYWINE 1 ATT 0001048.</p> <p>4. Defendants provide DSL modems to customers to transmit data from a customer's computer across the internet.</p> <p>5. Defendants are involved in determining the technical requirements for the DSL modems used and also for testing and deploying those modems but procure DSL modems from third-party vendors.</p> <p>6. Current DSL vendors for Defendants are Netgear, Inc., Motorola Mobility, and Pace plc. The modems from Pace are provided by Pace's subsidiary 2Wire, Inc.</p> <p>BRANDYWINE 1 ATT 000141.</p> <p>On information and belief, Defendant's OSS or other equipment can couple a transceiver corresponding to a mode of operation, for example allow one transceiver to failover to another in the event that the first transceiver malfunctions. On information and belief, Defendant's OSS or other equipment uses information stored in the management information base to select an operating transceiver for a local loop. G.997.1 at 7.3.1.1.1.</p>

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		<p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a subscriber loop. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
	<p>a selector, the selector selecting one of the transceivers to be electrically coupled to the subscriber loop; and</p>	<p>The infringing instrumentalities include a selector, the selector selecting one of the transceivers to be electrically coupled to the subscriber loop.</p> <p>On information and belief, Defendant's equipment includes a plurality of selectable transceivers that can operate over a subscriber loop. For example, Defendant's OSS or other equipment can couple a transceiver corresponding to a mode of operation, for example allow one transceiver to failover to another in the event that the first transceiver malfunctions. On information and belief, Defendant's OSS or other equipment uses information stored in the management information base to select an operating transceiver for a local loop. G.997.1 at 7.3.1.1.1.</p> <p>OSS systems are provided by vendors such as, for example, Oracle Corporation.</p> <div data-bbox="522 980 1113 1364">  <p>The logo for Oracle Communications MetaSolv Solution. It features the word "ORACLE" in red, "COMMUNICATIONS" in black, and "MetaSolv Solution" in red. Below the text is a 3D cube with four colored faces (yellow, blue, green, red) and a small globe on top.</p> </div> <p><b><u>Solution Capability</u></b></p> <ul style="list-style-type: none"> <li>• Enterprise-wide inventory convergence</li> <li>• Domain-specific: e.g. Optical, IP, Mobile, TDM, HFC, etc.</li> <li>• Order-to-Activate for VoIP and IP VPN</li> <li>• Task management through integrated work queues and assignments</li> <li>• Automation of provisioning process</li> </ul> <p>BRANDYWINE 1 ATT 001009; 1013.</p> <p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a</p>

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		<p>subscriber loop. For example, certain DSLAMs may implement a selection mechanism for a given type of DSL protocol. BRANDYWINE 1 ATT 001373. Certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
	<p>an Automatic Class Measurement device in communication with the selector, the Automatic Class Measurement device being configured to automatically select a mode that is compatible with at least one of the spectrum management classes and to cause the selector to select one of the transceivers to be electrically coupled to the subscriber loop.</p>	<p>The infringing instrumentalities include an Automatic Class Measurement device in communication with the selector, the Automatic Class Measurement device being configured to automatically select a mode that is compatible with at least one of the spectrum management classes and to cause the selector to select one of the transceivers to be electrically coupled to the subscriber loop.</p> <p>On information and belief, Defendant operates a test environment in which it can perform loop qualification tests on the local loops.</p>



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		<p><b>Figure 1. Typical CO Test Environment</b></p> <p>BRANDYWINE 1 ATT 000995.</p> <p>The testing environment comprises a test head in the exchange office which can, with control from an OSS, connect to the DSLAM or individual loops connected to the DSLAM. Id. The OSS, with access to the test heads, are able to perform tests that can determine available line speeds based on loop lengths and other loop characteristic parameters. BRANDYWINE 1 ATT 000997-998. The OSS may also monitor the spectral interference on a line. BRANDYWINE 1 ATT 000998.</p> <p>OSS systems are provided by vendors such as, for example, Oracle Corporation.</p>

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		<div data-bbox="525 310 1115 690" data-label="Image"> <p>The logo for Oracle Communications MetaSolv Solution. It features the word "ORACLE" in red, "COMMUNICATIONS" in black, and "MetaSolv Solution" in red. Below the text is a graphic of a 3D cube with four colored faces (yellow, blue, green, red) and a silver sphere in the center.</p> </div> <p><b><u>Solution Capability</u></b></p> <ul style="list-style-type: none"> <li>• Enterprise-wide inventory convergence</li> <li>• Domain-specific: e.g. Optical, IP, Mobile, TDM, HFC, etc.</li> <li>• Order-to-Activate for VoIP and IP VPN</li> <li>• Task management through integrated work queues and assignments</li> <li>• Automation of provisioning process</li> </ul> <p>BRANDYWINE 1 ATT 001009; 1013.</p> <p>On information and belief, Defendant's OSS is able to periodically test the subscriber line characteristics, determine the xDSL modes that allowable on the subscriber line, and select a transceiver to be used on the subscriber line.</p> <p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a subscriber loop. For example, certain DSLAMs may implement a selection mechanism for a given type of DSL protocol. BRANDYWINE 1 ATT 001373. Certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
7	The system of claim 5, wherein the modem provides a subscriber service, and the modem determines which of the spectrum management classes are compatible with the subscriber loop	<p>The infringing instrumentalities include a modem that provides a subscriber service, and the modem determines which of the spectrum management classes are compatible with the subscriber loop by performing a qualification test which disrupts the subscriber service.</p> <p>Defendant provides xDSL services to competitive local exchange carriers ("CLECs"), and these services comply with spectrum management classes.</p>

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	by performing a qualification test which disrupts the subscriber service.	<p>When CLECs request a DSL capable loop, they must specify the PSD number associated with the Spectrum Management Class of the technology deployed over the loop. The NC/NCI combination input on the LSR indicates the PSD number.</p> <p>BRANDYWINE 1 ATT 001088.</p> <h2 data-bbox="541 516 1936 604">AT&amp;T Wholesale Agreement</h2> <p>The High Frequency Spectrum shall be available for any version of xDSL complying with Spectrum Management Class 5 of ANSI T1.417, American National Standard for Telecommunications, Spectrum Management for Loop Transmission Systems. BellSouth will continue to have access to the low frequency portion of the Loop spectrum (from 300 Hertz to at least 3000 Hertz, and potentially up to 3400 Hertz, depending on equipment and facilities) for the purposes of providing voice service. Level 3 shall only use xDSL technology that is within the PSD mask for Spectrum Management Class 5 as found in the abovementioned document.</p> <p>BRANDYWINE 1 ATT 001105; 1220.</p>

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		Protocol	Protocol Option	Definition
		DU	Digital Access Interface @ End User Premises	
				Cannot be ordered without a Protocol Option
			001	Spectrum Management Class 1.
			002	Spectrum Management Class 2.
			003	Spectrum Management Class 3.
			004	Spectrum Management Class 4.
			005	Spectrum Management Class 5.
			007	Spectrum Management Class 7.
			008	Spectrum Management Class 8.
			00A	ADSL Using Discrete Multi-Tone (DMT) format
			00H	HDSL per <b>Ericsson (previously known as Telcordia Technologies)</b> TA-NWT-001210

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		Protocol	Protocol Option	Definition
		QB		Central Office Manual Cross Connect Termination With No Sub-Rating Capability For Non-Multiplexed Facilities Only. (Note: can be, but not limited to Collocation)
				Cannot be ordered without a Protocol Option
			00	MDF Cross-Connect
			001	Spectrum Management Class 1 w/unspecified cross connect cable shielding requirements.
			002	Spectrum Management Class 2 w/unspecified cross connect cable shielding requirements.
			003	Spectrum Management Class 3 w/unspecified cross connect cable shielding requirements.
			004	Spectrum Management Class 4 w/unspecified cross connect cable shielding requirements.
			005	Spectrum Management Class 5 w/unspecified cross connect cable shielding requirements.
			007	Spectrum Management Class 7 w/unspecified cross connect cable shielding requirements.
			008	Spectrum Management Class 8 w/unspecified cross connect cable shielding requirements. (Available in East region only)
		<p>BRANDYWINE 1 ATT 001063; 1072.</p> <p>On information and belief, Defendant's OSS and other equipment is able to determine a spectrum management class based in part on the results of the qualification test. On information and belief, such functionalities are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, loop qualification on certain loops disrupts the subscriber service.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>		



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8	<p>The system of claim 5, wherein the modem provides a subscriber service, and the modem determines which of the spectrum management classes are compatible with the subscriber loop by performing a qualification test without interfering with the subscriber service.</p>	<p>The infringing instrumentalities include a modem that provides a subscriber service, and the modem determines which of the spectrum management classes are compatible with the subscriber loop by performing a qualification test without interfering with the subscriber service.</p> <p>Defendant offers automatic loop qualification results for its CLECs and other customers to determine whether certain modes are available over certain loops. BRANDYWINE 1 ATT 001093.</p> <p>On information and belief, Defendant's OSS and other equipment is able to determine a spectrum management class based in part on the results of the qualification test. On information and belief, such functionalities are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, loop qualification is performed on certain loops without interfering with subscriber service, by relying on information in a loop database.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>

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9	The system of claim 5, wherein the modem, upon the determination of which of the spectrum management classes are compatible with the subscriber loop, automatically selects one of the modes that is compatible with one of the determined spectrum management classes.	<p>The infringing instrumentalities include a modem that, upon the determination of which of the spectrum management classes are compatible with the subscriber loop, automatically selects one of the modes that is compatible with one of the determined spectrum management classes.</p> <p>On information and belief, Defendant's OSS and other equipment is able to determine a DSL service mode based in part on a desired spectrum management class.</p> <p><b>5.5 Example systems of spectrum management classes</b></p> <p>Some example systems of spectrum management classes (SMC) are:</p> <ul style="list-style-type: none"> <li>– SMC 1: Basic Rate ISDN and SDSL with a line bit rate (LBR) satisfying <math>LBR \leq 288</math> kbps;</li> <li>– SMC 2: SDSL with an LBR satisfying <math>288 \text{ kbps} &lt; LBR \leq 528</math> kbps;</li> <li>– SMC 3: HDSL and SDSL with an LBR satisfying <math>528 \text{ kbps} &lt; LBR \leq 784</math> kbps;</li> <li>– SMC 4: HDSL2;</li> <li>– SMC 5: ADSL with non-overlapped spectra and RADSL;</li> <li>– SMC 6: VDSL;</li> <li>– SMC 7: SDSL with an LBR satisfying <math>1168 \text{ kbps} &lt; LBR \leq 1568</math> kbps;</li> <li>– SMC 8: SDSL with an LBR satisfying <math>784 \text{ kbps} &lt; LBR \leq 1168</math> kbps; and</li> <li>– SMC 9: ADSL with overlapped spectra.</li> </ul> <p>G.997.1 at 5.5.</p> <p>On information and belief, such functionalities are implemented in chip logic and/or software.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
11	The system of claim 5, wherein the modem is configured to determine	The infringing instrumentalities include a modem that is configured to determine which of the spectrum management classes are compatible with the subscriber loop by measuring subscriber loop length.


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	which of the spectrum management classes are compatible with the subscriber loop by measuring subscriber loop length.	<p>Defendant's OSS and testing equipment is able to measure loop characteristics, including loop length. BRANDYWINE 1 ATT 000997-998. The OSS, with access to the test heads, are able to perform tests that can determine available line speeds based on loop lengths and other loop characteristic parameters. BRANDYWINE 1 ATT 000997-998. On information and belief, Defendant's OSS saves the loop length and other loop characteristics information in a database.</p> <p>Defendant offers automatic loop qualification results for its CLECs and other customers to determine whether certain spectrum management classes are compatible with certain loops. BRANDYWINE 1 ATT 001093. The qualification process involves determining the loop length either through measurement with a test head or by use of loop information stored in an OSS database. BRANDYWINE 1 ATT 000997-998.</p> <p>On information and belief, Defendant's DSLAMs use a same or substantially same process to determine the loop length and, based on the result, determines whether certain spectrum management classes are compatible with the subscriber loop.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>
12	A system for communicating over a subscriber loop, the system comprising:	<p>To the extent this preamble is construed as a limitation, the infringing instrumentalities include, for example, Defendant's modems and/or digital subscriber line access multiplexers, which include transceivers for communicating over the subscriber loop, line testing equipment, along with the OSS for control, monitoring and testing DSLAMs.</p> <p>Together, this equipment constitutes a system for communicating over a subscriber loop.</p>
	a first modem located at a subscriber premise, the first modem being capable of operating in one or more modes that are compatible with one or more spectrum management classes defined by a standard, each spectrum management class defining power spectral	<p>The infringing instrumentalities include a first modem located at a subscriber premises, the first modem being capable of operating in one or more modes that are compatible with one or more spectrum management classes defined by a standard, each spectrum management class defining power spectral density (PSD) requirements.</p> <p>Defendant provides DSL modems to its subscribers for use at the subscriber's premises. On information and belief, Defendant provides the following customer premises modems:</p>

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	density (PSD) requirements;	<p>The customer premise equipment is provided by AT&amp;T (leased for a monthly fee or purchased with a 1-year warranty), and includes a wireless router and modem, referred to as a residential gateway or internet gateway, as well as TV receivers made by Cisco and Motorola (including standard receivers, wireless receivers, and DVR receivers).</p> <p>Gateway models frequently used include the 2Wire 3800, the 2Wire 3801, and the 2Wire iNID (including the 2Wire 3812 outside unit). The only VDSL gateway used is the 2Wire 3600. ADSL2+ installations are with Motorola's NVG510 internet gateway and, in the optional case for business customers, the Motorola 2210 or 2310 modem. There had been wide use of 2Wire's 2701 ADSL2+ gateway, but it was replaced by the NVG510, as the latter supported packet transfer mode (PTM), could be set on speeds higher than 6Mbit/s downstream (Elite), and was a Wireless N (2.4 GHz) wi-fi router. The EdgeMarc 250AEW (business) and Cisco E1000 and E1200 (residential) were tethered router solutions that were also replaced by the emergence of the NVG510.</p> <p>BRANDYWINE 1 ATT 000745-746.</p>

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		<div data-bbox="541 321 1801 370">  <b>AT&amp;T U-verse High Speed Internet Equipment Manuals and Guides</b> </div> <div data-bbox="541 443 1776 524"> <p><b>High Speed Internet:</b> U-verse Starter Guide <span>English PDF (7.6 MB)</span></p> </div> <div data-bbox="541 573 1684 727"> <p><b>Media Share Quick Start Guide:</b> PCs with Windows 7 <span>PDF (811 KB)</span> PCs with Windows Vista <span>PDF (605 KB)</span> PCs with Windows XP <span>PDF (434 KB)</span></p> </div> <div data-bbox="541 768 1684 1036"> <p><b>Self Installation</b> Wireless Gateway (NVG510) for High Speed Internet Only <span>PDF (5.7 MB)</span> Wireless Gateway (3600) for High Speed Internet Only ATT110900762 <span>PDF (132 KB)</span> Wireless Gateway (3600) for High Speed Internet Only ATT91800643-7 <span>PDF (3.0 MB)</span> Wireless Gateway (3800) for High Speed Internet Only ATT102400722 <span>PDF (917 KB)</span> High Speed Internet Modem 2210 User Guide ATT92400654-3 <span>PDF (278 B)</span> High Speed Internet User Guide ATT72300517-8 <span>PDF (278 B)</span></p> </div> <div data-bbox="541 1060 867 1092"> <p>BRANDYWINE 1 ATT 000752.</p> </div>







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		<p>4. Defendants provide DSL modems to customers to transmit data from a customer's computer across the internet.</p> <p>5. Defendants are involved in determining the technical requirements for the DSL modems used and also for testing and deploying those modems but procure DSL modems from third-party vendors.</p> <p>6. Current DSL vendors for Defendants are Netgear, Inc., Motorola Mobility, and Pace plc. The modems from Pace are provided by Pace's subsidiary 2Wire, Inc.</p> <p>BRANDYWINE 1 ATT 000141.</p> <p>These different types of DSL services operate under different spectrum management classes defined according to the T1.417 standard. See generally id. at 5.3.</p>

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		<p><b>5.5 Example systems of spectrum management classes</b></p> <p>Some example systems of spectrum management classes (SMC) are:</p> <ul style="list-style-type: none"> <li>– SMC 1: Basic Rate ISDN and SDSL with a line bit rate (LBR) satisfying <math>LBR \leq 288</math> kbps;</li> <li>– SMC 2: SDSL with an LBR satisfying <math>288 \text{ kbps} &lt; LBR \leq 528</math> kbps;</li> <li>– SMC 3: HDSL and SDSL with an LBR satisfying <math>528 \text{ kbps} &lt; LBR \leq 784</math> kbps;</li> <li>– SMC 4: HDSL2;</li> <li>– SMC 5: ADSL with non-overlapped spectra and RADSL;</li> <li>– SMC 6: VDSL;</li> <li>– SMC 7: SDSL with an LBR satisfying <math>1168 \text{ kbps} &lt; LBR \leq 1568</math> kbps;</li> <li>– SMC 8: SDSL with an LBR satisfying <math>784 \text{ kbps} &lt; LBR \leq 1168</math> kbps; and</li> <li>– SMC 9: ADSL with overlapped spectra.</li> </ul> <p>Id. at 5.5. The T1.417 standard defines the multiple spectrum management classes, each with different PSD requirements. T1.417 at 1.1, 5.3.1.1, 5.3.2.1.</p>
	<p>a second modem located at a central office, the second modem being capable of operating in one or more modes that are compatible with one or more of the spectrum management classes;</p>	<p>The infringing instrumentalities include a second modem located at a central office, the second modem being capable of operating in one or more modes that are compatible with one or more of the spectrum management classes.</p> <p>Internet service providers such as Defendant use network equipment called a DSLAM to provide xDSL services. Typically, the DSLAMs can deliver different types of xDSL services over the subscriber loop. A DSLAM includes one or more modems. DSLAMs are provided by vendors such as, for example, ADTRAN and ZyXEL. BRANDYWINE 1 ATT 001037-1038; 1039.</p> <p>On information and belief, Defendant uses DSLAM equipment from the following suppliers to provide xDSL to its customers:</p> <ul style="list-style-type: none"> <li>• ADC</li> <li>• ADTRAN</li> <li>• Alcatel-Lucent</li> <li>• Calix</li> <li>• Ericsson</li> <li>• Motorola</li> </ul>

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		<ul style="list-style-type: none"> <li>• Netgear</li> <li>• Pace</li> </ul> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p><b>H2TU-C-319</b></p>  <p>Product Catalog: H2TU-C-319-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-C-231</b></p>  <p>Product Catalog: H2TU-C-231-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-C-388</b></p>  <p>Product Catalog: H2TU-C-388-L7F/L7Fx</p> </div> <div style="text-align: center;"> <p><b>H2TU-R-402</b></p>  <p>Product Catalog: H2TU-R-402-L7F/L7Fx</p> </div> </div> <p>BRANDYWINE 1 ATT 000776.</p>

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		<p>The company's three major product categories are Carrier Systems, Business Networking and Loop Access.</p> <p><b>Carrier Systems</b> includes broadband access products comprising Total Access (TA) 5000 multi-service access and aggregation platform products, Total Access 1100/1200 Series Fiber-To-The-Node (FTTN) products, Digital Subscriber Line Access Multiplexer (DSLAM) products, and Optical access products.</p> <p>Customer concentration is the major and foremost risk for the company. Customers such as AT&amp;T, Verizon, and CenturyLink generate a major portion of the company's revenue. As long as these giant and independent companies represent a substantial percentage of the company's sales, any reduction or loss in business from these customers could negatively impact revenue growth, thereby restricting the company's profitability.</p> <p>BRANDYWINE 1 ATT 000146-147.</p> <p>U-verse uses the Alcatel-Lucent 7330 or 7340 Intelligent Services Access Manager (ISAM) shelf, also called a video-ready access device (VRAD), deployed either in a central office (CO) or to a neighborhood serving area interface (SAI). These models are both composed of circuit boards providing service, which are fed by fiber. FTTN (fiber to the node) systems use model 7330, which uses existing copper wiring to customers' homes,<sup>[2]</sup> leading to distance limitations from the VRAD cabinet to the customer's home. The 7330 ISAM is an internet protocol DSL access multiplexer that supports VDSL and ADSL protocols.<sup>[11]</sup> FTTP (fiber to the premises) systems use model 7340, which is mostly used in areas such as new neighborhoods or large-scale developments where fiber can be run to the household, removing the distance limitations of copper. The 7340 then connects to a serving area interface, which distributes service to homes in the neighborhood, via a dual strand fiber, which is then split into 32 customer fiber pairs. The fiber pairs are typically led into a customer's residence at the network interface device.</p> <p>The VRAD typically connects upstream to an Alcatel-Lucent 7450 Ethernet service switch in the central office hub, then to the headend video hub office.<sup>[2]</sup></p>

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		<p>BRANDYWINE 1 ATT 000745.</p> <p>AT&amp;T uses Alcatel-Lucent VDSL2 equipment in most of their curb-side cabinets, which in turn are primarily fed data via fiber optics. This put AT&amp;T in a position to deliver their next generation of U-Verse on a VDSL technology, fiber optics, or a combination of the two. While it is unlikely that AT&amp;T will move to FTTH (Fiber To The Home) meaning a 100% fiber optic network such as <a href="#">Verizon's FiOS</a>, the do have plenty of options to consider that might offer impressive speed boosts to consumers.</p> <p>BRANDYWINE 1 ATT 000750.</p> <p>Ericsson is fulfilling its North American wireline dreams as AT&amp;T named the Swedish vendor as one of its main suppliers under its newly-created "Domain Supplier" Program. This development comes after reports emerged in June that AT&amp;T wanted to <b>reduce</b> its telecom vendor list. Through this program, Ericsson will be eligible to supply full system solutions for AT&amp;T's wireline access network, including IP/DSLAMs and Fiber to the X platforms.</p> <p>Ericsson said in a press release that with its GPON gear set for "general deployment, AT&amp;T will now embark on integrating Ericsson's DSL portfolio for Fiber to the Node (FTTN) and IP DSLAM solutions to support AT&amp;T's U-verse offerings, such as IPTV, High Speed Internet and VoIP over an all IP network infrastructure."</p> <p>BRANDYWINE 1 ATT 0001045.</p>



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		<p>The vendors said they signed a global reseller agreement where Calix will serve as Ericsson's "preferred global partner for broadband access applications." Through this arrangement, Calix's newly expanded Unified Access portfolio, including both GPON and VDSL2 copper-based solutions to 180 countries worldwide.</p> <p>BRANDYWINE 1 ATT 0001048.</p> <p>4. Defendants provide DSL modems to customers to transmit data from a customer's computer across the internet.</p> <p>5. Defendants are involved in determining the technical requirements for the DSL modems used and also for testing and deploying those modems but procure DSL modems from third-party vendors.</p> <p>6. Current DSL vendors for Defendants are Netgear, Inc., Motorola Mobility, and Pace plc. The modems from Pace are provided by Pace's subsidiary 2Wire, Inc.</p> <p>BRANDYWINE 1 ATT 000141.</p> <p>According to the ANSI T1.417 standard, the different types of DSL services operate under different spectrum management classes to avoid interfering with each other. See generally id. at 5.3. Defendant's DSL equipment comply with these predefined spectrum management classes. BRANDYWINE 1 ATT 001063; 1072; 1105; 1220.</p>

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	a subscriber loop electrically coupling the first modem to the second modem	<p>The infringing instrumentalities include a subscriber loop electrically coupling the first modem to the second modem.</p> <p>In order to deliver its DSL service to customers, Defendant must couple the central office modem and the subscriber modem through a subscriber loop.</p>
	wherein the first and second modems cooperate with each other to determine which of the spectrum management classes are compatible with the subscriber loop;	<p>The infringing instrumentalities include first and second modems that cooperate with each other to determine which of the spectrum management classes are compatible with the subscriber loop.</p> <p>On information and belief, Defendant is able to use a modem connected to the subscriber end of the local loop to perform loop qualification testing. For example, certain customer premises end modems are able to perform a Dual End Loop Test (or DELT).</p> <p>DELT (dual-ended line testing) or loop diagnostics mode has been defined in ADSL2 or ITU-T G.992.3 standard.</p> <p>In general, SELT is more useful for pre-installation loop qualification because the remote end need not be connected. It can be used for loop diagnostics when the loop impairment is so severe that DELT can't be used because of load coils or a short. But DELT is more useful when both ends are connected because it provides better loop diagnostics and more detailed information.</p> <p>DELT requires a modification to the CPE (Customer Premises Equipment) splitter and/or modem to allow for OSP (Outside Plant) termination. The negative side of DELT is that it is dependent upon upgrading the customer site which is more difficult for the service provider to control. The positive aspect of DELT is that it can provide more accurate test measurements.</p> <p>BRANDYWINE 1 ATT 0001357; 1413-1414.</p>

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	<p>a plurality of transceivers, each transceiver corresponding to one of the compatible modes, wherein the modem electrically couples a corresponding transceiver to the subscriber loop upon selecting one of the modes;</p>	<p>The infringing instrumentalities include a plurality of transceivers, each transceiver corresponding to one of the compatible modes, wherein the modem electrically couples a corresponding transceiver to the subscriber loop upon selecting one of the modes.</p> <p>Defendant's DSLAMs include a plurality of selectable transceivers. Typically, the DSLAM is a rack-mounted device that can house as many as 500 transceivers. The DSLAM holds removable circuit cards, each containing a plurality of transceivers. BRANDYWINE 1 ATT 001037-1038; 1039. On information and belief, Defendant's OSS or other equipment can couple a transceiver corresponding to a mode of operation, for example allow one transceiver to failover to another in the event that the first transceiver malfunctions. On information and belief, Defendant's OSS or other equipment uses information stored in the management information base to select an operating transceiver for a local loop. G.997.1 at 7.3.1.1.1.</p> <p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a subscriber loop. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>

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	a selector, the selector selecting one of the transceivers to be electrically coupled to the subscriber loop; and	<p>The infringing instrumentalities include a selector, the selector selecting one of the transceivers to be electrically coupled to the subscriber loop.</p> <p>On information and belief, Defendant's equipment includes a plurality of selectable transceivers that can operate over a subscriber loop. For example, Defendant's OSS or other equipment can couple a transceiver corresponding to a mode of operation, for example allow one transceiver to failover to another in the event that the first transceiver malfunctions. On information and belief, Defendant's OSS or other equipment uses information stored in the management information base to select an operating transceiver for a local loop. G.997.1 at 7.3.1.1.1.</p> <p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a subscriber loop. For example, certain DSLAMs may implement a selection mechanism for a given type of DSL protocol. BRANDYWINE 1 ATT 001373. Certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>

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	<p>an Automatic Class Measurement device in communication with the selector, the Automatic Class Measurement device being configured to automatically select a mode that is compatible with at least one of the spectrum management classes and to cause the selector to select one of the transceivers to be electrically coupled to the subscriber loop.</p>	<p>The infringing instrumentalities include an Automatic Class Measurement device in communication with the selector, the Automatic Class Measurement device being configured to automatically select a mode that is compatible with at least one of the spectrum management classes and to cause the selector to select one of the transceivers to be electrically coupled to the subscriber loop.</p> <p>On information and belief, Defendant operates a test environment in which it can perform loop qualification tests on the local loops. BRANDYWINE 1 ATT 000995. The testing environment comprises a test head in the exchange office which can, with control from an OSS, connect to the DSLAM or individual loops connected to the DSLAM. Id. The OSS, with access to the test heads, are able to perform tests that can determine available line speeds based on loop lengths and other loop characteristic parameters. BRANDYWINE 1 ATT 000997-998. The OSS may also monitor the spectral interference on a line. BRANDYWINE 1 ATT 000998.</p> <p>On information and belief, Defendant's OSS is able to periodically test the subscriber line characteristics, determine the xDSL modes that allowable on the subscriber line, and select a transceiver to be used on the subscriber line.</p> <p>In addition, a physical transceiver may comprise a plurality of logical transceivers, each selectively operable over a subscriber loop. For example, certain DSLAMs may implement a selection mechanism for a given type of DSL protocol. BRANDYWINE 1 ATT 001373. Certain modems are capable of selecting a mode using "automode." G.997.1 at 7.3.1.1.10. In this situation, multiple DSL service modes are enabled in the MIB, and selection of the mode is made based on achievable data rates under given loop conditions. Id. On information and belief, the plurality of selectable logical transceivers are implemented in chip logic and/or software. BRANDYWINE 1 ATT 001412.</p> <p>On information and belief, review of Defendant's information produced in discovery, including review of source code, will confirm that the infringing instrumentalities meet this limitation.</p>